Masterproef industriële ingenieurswetenschappen

Performance evaluation of cloud based image processing on RACS for Augmented Reality devices

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Introduction

Augmented reality (AR) applications require extensive processing power on the mobile device with higher power consumption. This results in unexpected draining of the battery or malfunction of the application. Therefore, it is advantageous to use a cloud server to accomplish the real-time image processing.

The objective of this thesis is to measure the performance and the trade-off of offloading the processing from the device to a Radio Application Cloud Server.

Implementation

Move image processing:

- **From: Android applications**
- **To: a server on the RACS**

Total processing time comparison between:

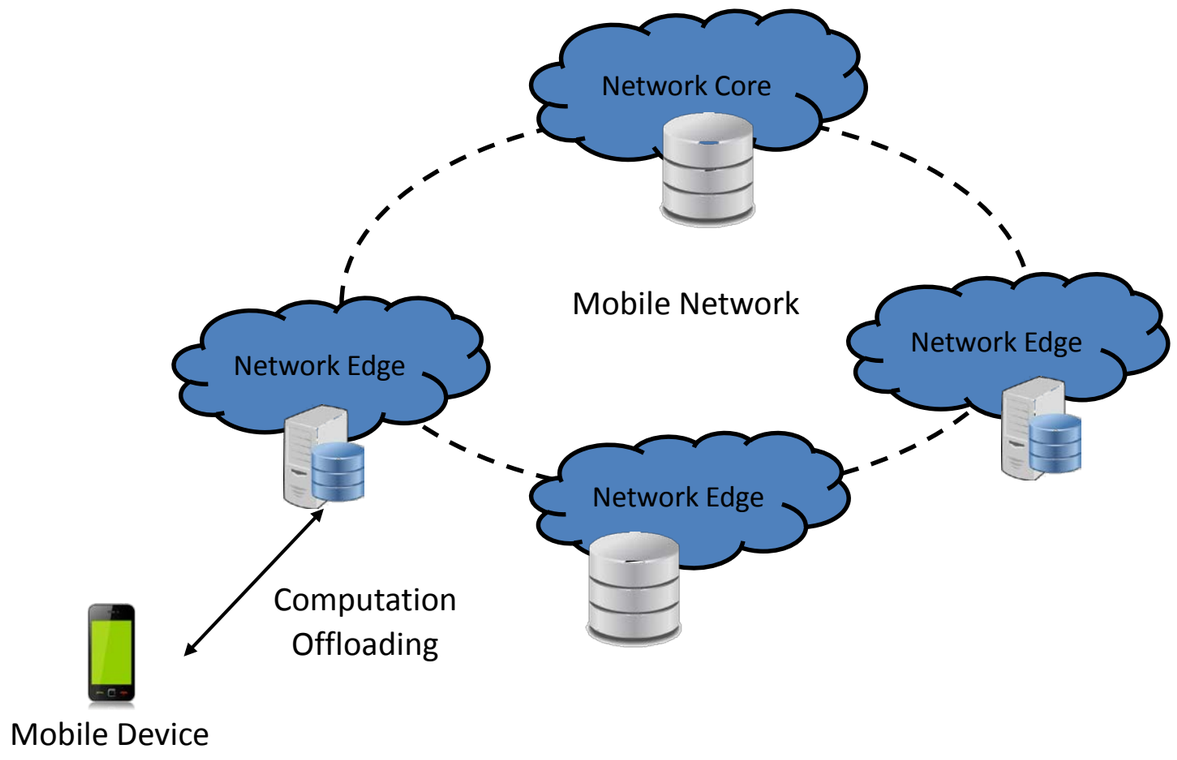
- **Image processing on device**
- **Image processing on server**

To evaluate if the relocation is profitable.

Radio Application Cloud Server

Relocation of the cloud functionality:

- **From: the network core**
- **To: the network edge**

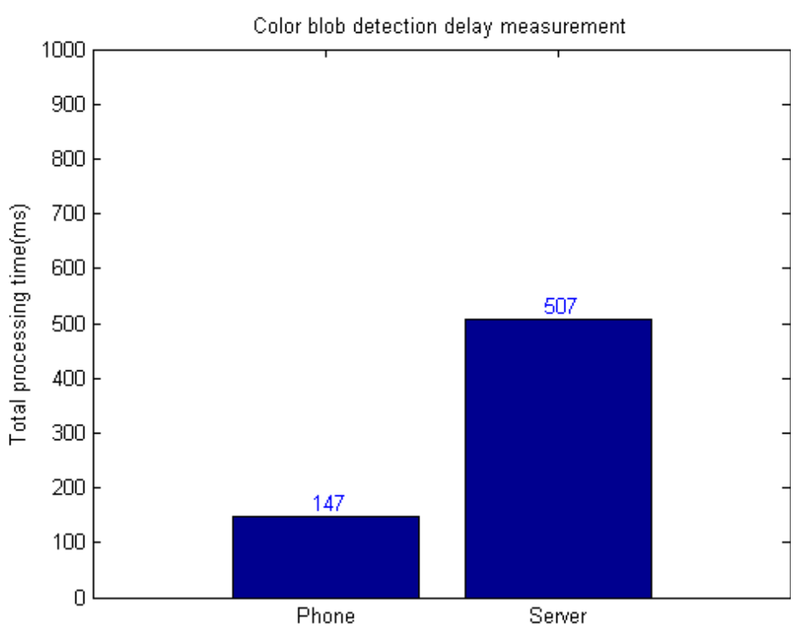


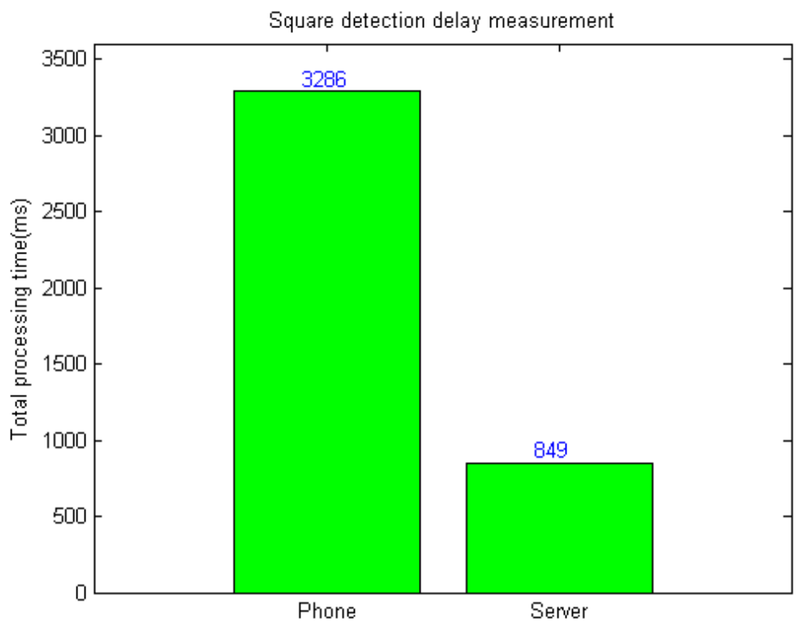
Conclusion

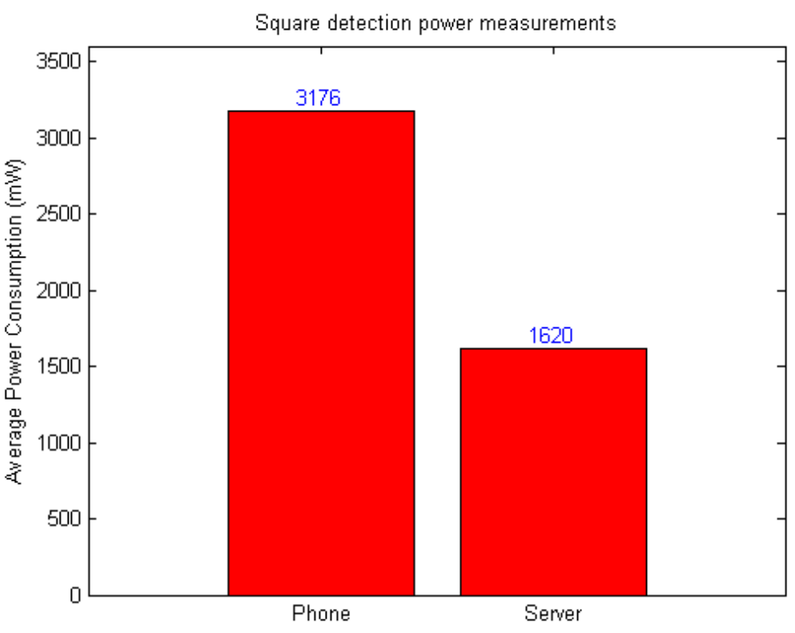
- **Color blob detection is too weak**
- **Square detection accelerated up to 80 %**
- **Power consumption reduced by 50 %**

Conclusion: profitable for complex operations.

Results







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